

## Analytic Geometry Review

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2} \quad r^2 = x^2 + y^2 \quad y = mx + b \quad m = \frac{y_2 - y_1}{x_2 - x_1} \quad MP \left[ \frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right]$$

1. Given the line  $3x + 5y - 10 = 0$  determine the slope.
2. What is the name of the triangle where all sides have the same length?
3. What is the distance between points A(3,-5) and B(-6,7)?
4. Determine the slope of a line perpendicular to the line  $\frac{2}{3}x - y = 8$
5. Determine the length of the line segment from C(-13,7) to D(5,20)

Determine the midpoint of the line segment joining C(2,1) and D(-2,9)

6.  $\triangle KLM$  has vertices  $K(-1,2)$ ,  $L(2,3)$ , and  $M(-3,4)$ . Find the equation for the median from  $K$  to  $ML$ .
7. The vertices of the  $\triangle DEF$  are  $D(4,2)$ ,  $E(-2,-2)$ , and  $F(2,-8)$ . Classify the triangle by side length
8. Show that the quadrilateral  $CDEF$  with vertices  $C(-11,-1)$ ,  $D(9,4)$ ,  $E(1,8)$ , and  $F(-19,3)$  is a parallelogram.

9.  $\triangle KLM$  has vertices  $K(-1,-2)$ ,  $L(2,3)$ , and  $M(-3,4)$ . Find an equation for the right bisector of  $MK$ .

10. Write an equation for the circle with centre  $(0, 0)$  and given radius.

- a) Radius 13
- b) Radius 4.5

11. Determine the radius of the circle with centre  $(0, 0)$  and given equation  $x^2 + y^2 = 1.69$


12. A square has vertices at  $U(-2,1)$ ,  $V(2,3)$ ,  $W(4,-1)$  and  $X(0,-3)$ . Verify that the diagonals perpendicularly bisect each other.

13. Verify that the quadrilateral with vertices  $O(0,0)$ ,  $P(3,5)$ ,  $Q(13,7)$ , and  $R(5,1)$  is a trapezoid

14. Find the shortest distance from the given point to the given line. Round to the nearest tenth, if necessary.  $(1,4)$  and  $y = x - 5$


15.  $\triangle KLM$  has vertices K (-1, -2), L (2, 3), and M (-3, 4). Find an equation for MP, the altitude from M to KL

16. A university has three student residences, which are located at points A(2,2), B(10,6), and C(4,8) on a grid. The university wants to build a tennis court an equal distance from all three residences. Determine the coordinates of the tennis courts.

17.  LMN has vertices at L(-5,4), M(2,-3), and N(1,4). Use analytic geometry to determine:

a. the coordinates of the centroid

b. the coordinates of the orthocentre

18.  ABC has vertices at A(4,2), B(0,4), and C(2,-2). Use analytic geometry to determine:

a. the coordinates of the circumcentre